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THE COMPARATIVE ROLES OF BRAILLE AND THE TALKING BOOK IN THE ADULT LIVES OF A GROUP OF FORMER BRAILLE STUDENTS

by
Francis Eugene Heger

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in the
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TABLE OF CONTENTS

Page

ACKNOWLEDGMENTS ii

LIST OF TABLES vi

CHAPTER

I. DEVELOPMENT OF THE PROBLEM 1

Historical Considerations 1
Status of Braille 3
The Problem 6

II. PROCEDURES 7

The Sample 7

Selection of the subjects
Description of the subjects

The Instruments 19

The questionnaire
The Gray Oral Reading Paragraphs

Conducting the Interviews 20
Limitations 22

III. RESULTS 24

Comparison of Users and Nonusers of Braille 24

Source of braille instruction

CHAPTER Page

Number of school grades completed
Intelligence
Age
Sex
Marital status
Degree of visual loss
Employment
Braille reading proficiency
Attitudes toward braille
Summary

The Nature and Frequency of Braille Uses 37

Specific uses of braille
The frequency of braille use by activity area
Nature of braille use related to the variables

The Subjects' Proficiency in Braille Reading 42
Comparison of Users and Nonusers of the Talking Book 45
Comparative Usefulness of Braille and the Talking Book 49

IV. SUMMARY AND CONCLUSIONS 52

APPENDIXES 63

A. The Interview Questionnaire 64

B. The Gray Oral Reading Paragraphs 68

C. Specific Uses of Braille 70

D. Suggestions for Educational Improvement 71

BIBLIOGRAPHY 73

LIST OF TABLES

TABLE | Page

1. Distribution of Subjects by Age, Sex, and Source of Braille Instruction 10

2. Marital Status of the Subjects According to Sex and Source of Braille Instruction 12

3. Degree of Visual Loss of Subjects According to Sex and Source of Braille Instruction 13

4. Employment Status of the Subjects According to Sex and Source of Braille Instruction 14

5. The Intelligence Quotients of Subjects According to Sex and Source of Braille Instruction . . . 16

6. Highest School Grades Completed by Subjects According to Sex and Source of Braille Instruction 18

7. Comparison of Proportions of Users of Braille According to Source of Braille Instruction 26

8. Comparison of Mean Grades of School Completed by Users and Nonusers of Braille 26

9. Comparison of Mean Intelligence Quotients of Users and Nonusers of Braille 27

10. Comparison of Mean Ages of Users and Nonusers of Braille 28

11. Comparison of Proportions of Users of Braille According to Sex 28

TABLE Page

12. Comparison of Proportions of Users of Braille According to Marital Status 30

13. Comparison of Proportions of Users of Braille According to Degree of Visual Loss 30

14. Comparison of Proportions of Users of Braille According to Employment 31

15. Comparison of Mean Braille Reading Levels of Users and Nonusers of Braille 33

16. Comparison of Mean Words per Minute Read in Braille by Users and Nonusers of Braille 33

17. Comparison of Proportions of Users of Braille According to Recalled Affect toward Braille Instruction 34

18. Comparison of Proportions of Users of Braille According to Organizational Affiliation with Other Blind People 34

19. Comparison of Proportions of Users of Braille According to Attitude toward Universal Braille Opportunity for Blind Children 35

20. Modes of Writing Indicated by Subjects 38

21. Number of Subjects Who Used Braille According to Frequency of Use in Two Areas of Activity 39

22. Vocational and Avocational Uses of Braille Related to the Variables 41

23. Relationship between the Variables and Braille Reading Proficiency 43

TABLE Page

24. Comparison of Proportions of Users of Braille According to Willingness to Read Oral Paragraphs 44

25. Comparison of Proportions of Users of Talking Books According to Eight Variables 45

26. Comparison of Users and Nonusers of Talking Books According to Five Different Variables . . . 46

27. Number of Subjects Who Used the Talking Book According to Frequency of Use in Two Areas of Activity 47

28. Vocational and Avocational Uses of the Talking Book Related to the Variables 48

29. Percentages of Subjects Who Used Braille and the Talking Book in Vocational and Avocational Activities 50

CHAPTER I

DEVELOPMENT OF THE PROBLEM

Historical Considerations

"When eyes take holiday and wisdome at one entrance [is] quite shut out," substitutes for sight must be found. John Milton's allusion to his own blindness is exemplary of the total historical effort to provide for the blind devices and methods of reading and writing that would be equivalent to those for the sighted. Long before tangible techniques were discovered, primitive methods were devised to utilize what were assumed to be the natural compensatory abilities of the blind. In Japan, instead of having the history of the country written in books, the events were related to blind men who committed them to memory and served as talking depositories of historical information (Zahl, 1950, p. 313). Early notions regarding the mystical nature of sensory compensation are typified by the nineteenth-century experimenter who reported that "blind persons were better able than seeing ones to indicate the direction of sound" and raised the possibility of appointing "blind persons on vessels for accurately determining in foggy weather the direction of signals made by other vessels or the location of landing places" (Hayes, 1941, pp. 22-23).

Scientific progress has attributed the wonderful feats of memory and sensory compensation not to inherent or mystical qualities but to the purposeful training of the remaining senses of the blind. One of the earliest compensatory reading techniques was the string alphabet, reportedly devised in Peru and later refined for use with blind pupils in Scottish and English schools (Zahl, p. 314). In the string alphabet, various loops and knots indicated alphabetical letters, and the blind individual's fingers spelled words by picking out the component letters in the string.

Modern efforts have focused on methods of reading and writing more similar to those used by sighted people. Valentin Haüy's development of embossed type in 1786 won for him the title of "the father of the education of the blind" (Zahl, p. 316). The dot systems introduced by Charles Barbier and Louis Braille in the early 1800's violated Haüy's fundamental premise that a reading method for the blind must be highly adaptable for use by the sighted. The long "battle of the types" which ensued culminated in the twentieth-century emergence of braille as the most widely accepted medium of reading and writing for the blind.

Status of Braille

In hailing braille as "the tool which has made blind individuals literate rather than illiterate," Krebs (1959, p. 133) expressed the high esteem in which braille is held by a majority of writers and educators. Maxfield, an outstanding psychologist and educator of the blind, contended that "every blind person who has average ability and normally sensitive fingers can learn to read braille" (Maxfield, 1926, p. 8). Her treatment of the blind child's reading was devoted almost entirely to a discussion of braille methodology and stressed that reading in braille should comprise an equal or greater portion of the school day for the blind child than for the sighted child (Maxfield, 1928, p. 32). A blind first-grader would, in a school oriented in Maxfield's doctrines, spend more time in reading during the typical school day than the 33 percent estimated for the sighted first-grader. That such emphasis on braille reading does continue to exist is evidenced by the fact that no authoritative and comprehensive treatment of braille reading has come forward to supplant Maxfield's 1928 model (Lowenfeld, 1963, p. 40).

In spite of its generally high esteem, braille has not been without its critics. One writer contended that "not more than 10 percent of the blind in the United States ever master finger reading well enough to enjoy embossed books'' (Zahl, p. 347). A recent investigation involving 684 blind adults in Massachusetts, North Carolina, Minnesota, and Oregon revealed that braille users constituted 28 percent of all those who were actually able to read braille and 7.5 percent of all subjects (American Foundation for the Blind, 1961). Furthermore, only 3.8 percent of the total sample reported that braille was their primary mode of reading.

In a study of 14,125 blind children, 58 percent used braille (U.S., Department of Health, Education, and Welfare, 1961). Severely handicapped residential school pupils were more likely than less handicapped day school pupils to be readers of braille. Regardless of visual loss or type of schooling, the children tended to use braille progressively less as they advanced through school. Although the AFB and HEW studies considered different age groups, both implied that blind people who have received instruction in braille use it less as they grow older.

The supporters of braille have insisted that it is a necessity because it affords a higher level of comprehension to the blind reader and thus a greater degree of independence in communication (Lende, 1941, p. 171). A study involving blind children in grades three, four, six, and seven casts considerable doubt on braille's superiority in fostering comprehension and indicates a marked advantage for auditory techniques in time efficiency (Nolan, 1963, p. 315). The slowness with which braille is read has been a major criticism. Braille's time disadvantage seems all the more marked when it is considered that talking books are recorded at an average of 175 words per minute, while the average adult braille reading speed is only about 90 words per minute (Nolan, 1963, p. 315).

Braille's slowness is not its only disadvantage. A dictionary for secondary school use, which in ink print takes very little space, requires about thirty oversized volumes in braille; therefore, "there is not likely to be any great market for braille material in its present bulk" (Ritter, 1956, p. 12). The circulation of talking books far exceeds that for braille materials in libraries for the blind (Parks, 1963, p. 15-E). Though talking books themselves are bulky, they are less so than braille volumes; furthermore, anticipated reductions of talking books into compact cassettes and tape cartridges will presumably increase their appeal.

Thus, though braille is esteemed by a great number of educators of the blind, it is viewed with some skepticism by others. Remarkably, it would seem that whether an educator supports or is critical of braille, his feelings have been determined largely by factors other than scientific evidence. Seriously lacking are systematic efforts to evaluate objectively the long-term usefulness of braille to the blind individuals for whom it was designed.

The Problem

This investigation focused on blind adults who had, as children, received braille instruction. The object was to ascertain the extent to which they used braille as compared to the talking book both in vocational and avocational activities.

The following specific questions were investigated in relation to the above objective:

1. How many of the former braille students found braille useful in their adult lives?
2. For what kinds of activities did they find braille useful and how often?
3. How proficiently were they able to use braille?
4. How significant to their present tendency to use or refrain from using braille were the variables of age, sex, marital status, source of braille instruction, number of school grades completed, IQ, degree of visual handicap, employment status, attitudes toward braille, and present proficiency?
5. How useful was braille in comparison to talking books?

The procedures involved in selecting the subjects and gathering the data necessary to answer the above questions are described in the chapter which follows.

CHAPTER II

PROCEDURES

The Sample

Selection of the subjects

The study was limited to blind subjects selected on the basis of specific criteria of age, educational background, and residence. Defined as eligible were blind individuals born between 1915 and 1940, inclusively, who had received braille instruction while enrolled either in the braille classes of the Detroit Public Schools or at the Michigan School for the Blind. Further, subjects were residents of Wayne, Oakland, Monroe, Washtenaw, or St. Clair Counties at the time of their enrollment in the Detroit or Lansing program and remained residents of one of these counties at the time interviews were conducted. Blind individuals who met all of the above criteria were eligible regardless of degree of visual loss, race, sex, or intelligence.

With the population defined, the next step involved the identification of eligible subjects. The master files of the Detroit and

Lansing programs were the primary sources of background information. Recorded separately on 4″ × 6″ index cards from the files for each eligible subject were name, birthdate, address at the time of school enrollment as well as current address, educational history, intellectual ability, and the degree of visual loss.

Since, in some cases, all the desired information was not available in the school files, supplementary information was sought from the Division of Services for the Blind of the Michigan Department of Social Welfare, the Michigan Council for the Blind, the Detroit League for the Handicapped, and the Michigan Association of Workers for the Blind. The current addresses of the subjects proved to be especially difficult to ascertain even with the cooperation of these agencies. In some cases, it was the blind subjects themselves who were more helpful in providing information as to the current whereabouts of other blind subjects. The sum total of identifying information was the result of the collective aid of many organizations and individuals.

Description of the subjects

A total of 79 eligible subjects were actually interviewed. Of an original list of 201 potentially eligible candidates, 69 were found to have moved out of the designated geographical area, 5 others became ineligible when more extensive investigation revealed for them an absence of braille instruction, and 22 could not be located even with the aid of school and agency files, telephone directories, organization membership lists, and other blind individuals. The 26 remaining subjects who might have been eligible were not interviewed for the following reasons: 8 were deceased and 10 were hospitalized indefinitely for physical or mental illness; 1 expressed a definite preference not to be interviewed; and, for 7, repeated attempts to arrange for interviews were unsuccessful. The 79 who were interviewed did, in effect, represent a nearly unanimous proportion of those individuals who were not ruled ineligible during the process of collecting more extensive background data.

Nearly all the subjects were, at the time they were interviewed, residents of Wayne County. Table 1 shows that Lansing subjects were slightly outnumbered by those from the Detroit schools, and females were slightly outnumbered by males. For purposes of this study, seven subjects who had attended both the Detroit and Lansing programs were grouped with that school source at which their braille instruction had been initiated. The indicated totals include six such subjects for Detroit and one for Lansing. The subjects averaged thirty-one years in age.

TABLE 1

DISTRIBUTION OF SUBJECTS BY AGE, SEX, AND SOURCE OF BRAILLE INSTRUCTION

Sex	No. of Subjects	Chronological Age		
		Median	Mean	s
		Instruction in Detroit		
Male	24	32.50	31.50	6.0
Female	18	29.50	30.33	6.5
Total	42	31.50	31.00	6.2
		Instruction in Lansing		
Male	18	28.83	31.17	6.7
Female	19	30.63	30.84	7.0
Total	37	29.33	31.00	7.0
		All Subjects		
Male	42	30.50	31.36	6.3
Female	37	30.25	30.59	6.8
Total	79	30.38	31.00	6.5

The marital status of the subjects is shown in Table 2. The inclusion of but one divorced person in the "single" category indicates that those subjects who did marry tended to remain married. That only 38 percent of them were married, however, suggests a rate or incidence of marriage lower than that for the general adult population.

The degree of subjects' visual loss is shown in Table 3. Though data concerning visual loss were available in each subject's school records, the information was not sufficiently detailed to allow for differentiation into a large number of clear-cut levels of vision. The differentiation that was made considered subjects at three general levels of vision: first, those who were totally blind; second, those who were able to perceive light or motion only; and third, those who possessed visual acuity which was quantifiable but not better than 20/200. Subjects were rather evenly divided among the three levels. Any expectation that a greater proportion of former residential pupils would be totally blind was dispelled, for this particular sample at least; actually, a somewhat higher proportion of the former day school pupils were totally blind.

Table 4 shows the number of subjects who were employed in the major occupational categories defined by the United States Bureau of the Census (U.S., Department of Commerce, 1962, p. 217).

TABLE 2

MARITAL STATUS OF THE SUBJECTS ACCORDING TO SEX AND SOURCE OF BRAILLE INSTRUCTION

Sex	Marital Status	
	Single	Married
Instruction in Detroit		
Male	14	10
Female	13	5
Total	27	15
Instruction in Lansing		
Male	12	6
Female	10	9
Total	22	15
All Subjects		
Male	26	16
Female	33	14
Total	49	30

TABLE 3

DEGREE OF VISUAL LOSS OF SUBJECTS ACCORDING TO SEX AND SOURCE OF BRAILLE INSTRUCTION

Degree of Vision	Sex		
	Male	Female	Total
Instruction in Detroit			
Total blindness	9	8	17
Object, light perception	10	5	15
Upper limit of legal blindness	5	5	10
Instruction in Lansing			
Total blindness	4	5	9
Object, light perception	4	9	13
Upper limit of legal blindness	10	5	15
All Subjects			
Total blindness	13	13	26
Object, light perception	14	14	28
Upper limit of legal blindness	15	10	25

TABLE 4

EMPLOYMENT STATUS OF THE SUBJECTS ACCORDING TO SEX AND SOURCE OF BRAILLE INSTRUCTION

Occupational Category	Sex		
	Male	Female	Total
Instruction in Detroit			
Professional and management . . .	5	4	9
Clerical and sales	8	1	9
Service occupations	2	0	2
Semiskilled labor	0	0	0
Total employed	15	5	20
Housewives and students	2	7	9
Unemployed	7	6	13
Instruction in Lansing			
Professional and management . . .	2	1	3
Clerical and sales	5	1	6
Service occupations	2	0	2
Semiskilled labor	2	1	3
Total employed	11	3	14
Housewives and students	0	10	10
Unemployed	7	6	13
All Subjects			
Professional and management . . .	7	5	12
Clerical and sales	13	2	15
Service occupations	4	0	4
Semiskilled labor	2	1	3
Total employed	26	8	34
Housewives and students	2	17	19
Unemployed	14	12	26

Housewives and college students formed a separate group intermediate to the employed and unemployed. Though subjects engaged in either the housewife or student capacity were financially unrewarded, they were, in a sense, gainfully employed in that their respective roles were presumed to be socially and personally productive or in preparation for future productivity.

Sales and professional occupations were indicated by several subjects, but few were employed in the remaining occupation categories. Since no subjects were employed in agriculture and forestry, skilled or unskilled labor, these categories were omitted from Table 4. The most frequently mentioned specific occupations were teaching and social work with other blind people and the sale of goods to other blind consumers.

The 33 percent who were neither employed nor in the housewife-student capacity far exceeded the 5.6 percent and 6.7 percent rate of unemployment for the adult population at large for 1960 and 1961, respectively (U.S., Department of Commerce, p. 215).

For seventy of the seventy-nine subjects, IQ scores were available. In nearly all cases the Hayes-Binet Test had been used. Table 5 indicates that the subjects, as a group, possessed intellectual ability well within the average range.

TABLE 5

THE INTELLIGENCE QUOTIENTS OF SUBJECTS ACCORDING TO SEX AND SOURCE OF BRAILLE INSTRUCTION

Sex	No. of Subjects	Intelligence Quotient		
		Median	Mean	s
		Instruction in Detroit		
Male	24	105.64	105.72	20.6
Female	17	106.13	103.38	20.3
Total	41	105.82	104.78	20.3
		Instruction in Lansing		
Male	13	105.00	108.46	19.9
Female	16	102.30	99.38	20.7
Total	29	103.31	103.45	20.4
		All Subjects		
Male	37	105.45	106.70	20.2
Female	33	104.00	101.45	20.4
Total	70	104.76	104.23	20.3

Table 6 shows the highest mean school grade completed by the subjects. The typical blind subject had completed the twelfth grade. In contrast, the 1960 United States Census had reported national and state medians of 8.6 and 10.8 grades respectively (U.S., Department of Commerce, pp. 117-18). The generally high level of educational attainment and intellectual ability demonstrated seems to be a logical corollary of the selection of former braille students exclusively as subjects for study.

The typical subject was an unmarried resident of Wayne County in his early thirties who was of average intelligence and had completed high school. The sample consisted of a slightly higher proportion of males than females, and subjects who had received their initial braille instruction in Detroit slightly outnumbered those whose braille instruction had originated at the Michigan School for the Blind. Subjects were rather evenly distributed among three levels of visual loss ranging from total blindness to the upper limit of legal blindness. Approximately 33 percent of the subjects were not employed, and 24 percent were housewives or college students. The remaining 43 percent who were employed were primarily engaged in the professions of teaching and social work and in sales capacities.

TABLE 6

HIGHEST SCHOOL GRADES COMPLETED BY SUBJECTS ACCORDING TO SEX AND SOURCE OF BRAILLE INSTRUCTION

Sex	No. of Subjects	Highest School Grade Completed		
		Median	Mean	s
		Instruction in Detroit		
Male	24	11.50	11.58	2.4
Female	18	12.06	12.38	2.5
Total	42	11.72	11.92	2.5
		Instruction in Lansing		
Male	18	11.83	12.06	3.0
Female	19	11.20	10.55	3.3
Total	37	11.50	11.28	3.2
		All Subjects		
Male	42	11.63	11.79	2.7
Female	37	11.61	11.45	3.1
Total	79	11.62	11.63	2.9

The Instruments

The questionnaire

In order to minimize interviewer bias, a questionnaire was devised. A copy is shown in Appendix A. Items were included to obtain the data necessary to answer the questions proposed to meet the objectives of this study.

The Gray Oral Reading Paragraphs

Since an assessment of the subjects' present proficiency in braille reading could not be obtained from school records, a direct measurement was employed. For this purpose the Gray Oral Reading Paragraphs in Grade II braille were obtained from the American Printing House for the Blind in Louisville, Kentucky. A copy of the Gray paragraphs is included in Appendix B.

In the absence of published standardized results for adults, a system was devised to make internal comparisons among the subjects of this study alone. The procedure followed was similar to that prescribed for the vocabulary section of the Wechsler Intelligence Scales and for the reading section of the Wide Range Achievement Test; that is, the reader continued until he found it impossible or extremely difficult to progress upward in grade level or until he had exceeded an arbitrary limit of three errors at any given level.

When, as was true in a few cases, the paragraph designated as the starting point proved to be too elementary, the interviewer asked the reader to skip paragraphs in order to approach a level at which an element of difficulty could be discerned. Each reading was timed, but the time officially recorded was that for the highest-level paragraph completed successfully. Maximum time recorded was three minutes.

The grade level and reading time recorded became the criteria by which the general level of a subject's proficiency in braille was evaluated and also provided the data for determining the relationship between braille proficiency and a subject's tendency to use or not use braille.

Conducting the Interviews

The interviews were conducted between November 29, 1961, and April 10, 1962. In all but a few cases, the interviews were prearranged by means of a letter or, more often, a telephone conversation. Each was arranged and held at a time and place convenient to the subject. The subject's private dwelling proved to be the most popular place, and weekends and evenings, the most popular times. In a few cases, the subject's place of employment or a nearby coffee shop was used (when the subject expressed such a preference for location), and in a few others interviews were held without benefit of prior arrangement (when the location of the subject was known but attempts to reach him ahead of time were unsuccessful). The interviews ranged in length from one-half hour to two full hours. No attempt was made to limit the duration of the visit, and no detailed record was kept of the exact length of the interviews. It was felt that a strict adherence to a time limit would tend to prevent the establishment of adequate rapport with quieter, more reticent subjects and interfere with the freedom of expression of others.

The fact that only one subject refused to be interviewed is indicative of the attitudes encountered. Even those subjects who at first seemed reticent appeared to enjoy the interview sessions. Many volunteered additional information, including the addresses of other subjects, suggestions for facilitating the execution of the study, and their feelings toward a vast range of problems relating to their blindness. No attempt was made to discourage such comments since they seemed to enable the subjects to feel more relaxed. Caution was taken to avoid the biasing which might have occurred had interviewer opinions been interjected during the formal questionnaire phase. Out of the "superfluous" phases of the interviews came some of the least quantifiable but most provocative information relative to the total education and adjustment of the blind.

Limitations

The results of this study must be viewed as limited in terms of their meaning to the total blind population. The subjects interviewed did not comprise a random sample even for the defined geographical area. The resulting number (79), however, represented a nearly unanimous proportion of the available and eligible subjects for whom the findings were desired. Any extension of the findings to the blind at large will be limited to broad and highly tentative implications.

The study was also limited in that (1) the school record information was sometimes incomplete; and (2) the subjects' testimonies, in some cases, may have been of questionable veracity. In regard to the inaccuracies imposed by the files and by subject testimonies, it should be mentioned that an analysis of the total information sources revealed few inconsistencies or missing information. The high level of agreement found between the records and the interview responses suggests that both sources were generally accurate. The enthusiastic cooperation manifested by the subjects suggests that their responses were a genuine representation of their feelings and attitudes. It would seem that an honest portrayal of how the blind individuals felt toward instruments of their own education would be just as meaningful as the bulk of literary opinion which itself is predicated largely on a subjective basis.

CHAPTER III

RESULTS

A statement to the effect that fifty-five of the seventy-nine subjects indicated some current use of braille reveals nothing of the extent and nature of braille's usefulness. To determine which subjects used braille, for what, how often, and how well, a series of statistical comparisons was made. The results are described in the sections which follow.

Comparison of Users and Nonusers of Braille

The chi-square and *t* statistic (Dixon and Massey, 1957, pp. 221-25, 118-23) were employed to compare the users and nonusers of braille on the variables indicated in Chapter II. Asterisks are used to denote significance at the 1 percent (**) and 5 percent (*) levels. Interpretations of a significant *t* ratio should always be made with respect to the sign of the difference. For each comparison with one degree of freedom, the chi-square indicated is the result of the application of a special correction factor (Dixon and Massey, pp. 225-26).

Source of braille instruction

Table 7 compares the proportions of users of braille who had received their initial braille instruction at Lansing and Detroit. The difference between the proportions is not significant. It appears, therefore, that subjects were just about as likely to use braille whether they had received their instruction in Detroit or at Lansing.

Number of school grades completed

In Table 8 are compared the users and nonusers of braille according to mean grades of school completed. Although the mean grades of school completed by the users is slightly above that of the nonusers, the difference is not significant. In other words, the users of braille did not appear to have had materially more education, on the average, than the nonusers.

Intelligence

Table 9 compares the mean IQ's of users and nonusers of braille. Missing data concerning the IQ's of nine subjects reduced the sample from previous tables. A significant difference appears in the table in favor of the users of braille. This is to say that the users of braille were brighter on the average than the nonusers.

TABLE 7

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO SOURCE OF BRAILLE INSTRUCTION

Source of Instruction	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Detroit	42	31	73.8	1	.22
Lansing	37	24	64.9		

TABLE 8

COMPARISON OF MEAN GRADES OF SCHOOL COMPLETED BY USERS AND NONUSERS OF BRAILLE

Subjects	N	Grades Completed		Diff.	df	*t*
		Mean	s			
Users	55	11.83	2.8	.13	77	.93
Nonusers	24	11.70	3.0			

TABLE 9

COMPARISON OF MEAN INTELLIGENCE QUOTIENTS OF USERS AND NONUSERS OF BRAILLE

Subjects	N	I.Q.		Diff.	df	*t*
		Mean	s			
Users	50	106.98	20.1	9.13	68	1.75*
Nonusers	20	97.85	18.5			

This finding suggests that the brighter the subject, the more likely he was to use his knowledge of braille.

Age

Table 10 shows that the mean age of the nonusers of braille was above that of the users, but the difference was not significant. Thus, age did not seem to have a serious bearing on whether or not the subject used braille.

Sex

The proportions of males and females who were users of braille are compared in Table 11. Although a somewhat higher proportion of females than males used braille, the difference was

TABLE 10

COMPARISON OF MEAN AGES OF USERS AND NONUSERS OF BRAILLE

Subjects	N	Mean Age	Diff.	df	t
Users	55	30.19	-2.68	77	1.33
Nonusers	24	32.87			

TABLE 11

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO SEX

Sex	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Male	42	25	60.0	1	3.36
Female	37	30	81.1		

not significant. It cannot be conclusively stated that females were much more likely to use braille than males.

Marital status

Table 12 compares the proportions of married and unmarried subjects who used braille. The difference was not significant. Marital status obviously did not differentiate between the users and non-users of braile.

Degree of visual loss

In Table 13, users of braille are compared according to the degree of their visual loss. The proportion of users among the most severely handicapped was significantly higher than that for the less visually handicapped. In other words, the greater the visual loss, the greater the likelihood that a subject would use braille. This stands to reason.

Employment

Table 14 indicates that the proportion of braille users among the employed subjects was not significantly higher than among the unemployed subjects. Employment per se does not appear to have been relevant to a subject's tendency to use or not to use braille.

TABLE 12

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO MARITAL STATUS

Marital Status	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Married	30	21	70.0	1	.05
Unmarried	49	34	69.4		

TABLE 13

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO DEGREE OF VISUAL LOSS

Visual Loss	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Total blindness	26	22	84.6	2	6.47*
Object, light perception	28	20	71.4		
Upper limit of legal blindness	25	13	52.0		

TABLE 14

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO EMPLOYMENT[a]

Employment Status	No. of Subjects	No. of Users	Pct. of Users
Employed			
Professional and management . .	12	8	66.7
Clerical, sales	15	10	66.7
Service	4	3	75.0
Semiskilled	3	3	100.0
Total employed	34	24	70.6
Quasi-employed			
Housewives	13	10	76.9
Students	6	5	83.3
Total quasi-employed	19	15	77.8
Unemployed			
Total unemployed	26	16	61.5

[a] *df* = 2; $\chi^2 = 2.04$.

Braille reading proficiency

Table 15 indicates that users of braille read at a significantly higher mean grade level on the Gray Oral Reading Paragraphs than the nonusers of braille. Table 16 shows that the users also tended to read more rapidly, but their advantage in this case was not significant. That the better readers manifested any advantage at all is noteworthy in light of the fact that they were scored and timed in paragraphs that were at a higher level of difficulty.

Attitudes toward braille

Table 17 indicates that there was a higher proportion of braille users among subjects who had enjoyed braille instruction than among those who had not enjoyed it. However, since the difference is not significant, it cannot be definitely stated that a subject's recalled feeling toward braille instruction was highly related to his tendency to use or not to use braille.

In Table 18, the users of braille are compared according to their preferences to affiliate or not to affiliate with organizations consisting largely of other blind people. Since the difference between proportions is not significant, it appears that a subject's preference to affiliate or not affiliate with other blind people was not relevant to his tendency to use or refrain from using braille.

TABLE 15

COMPARISON OF MEAN BRAILLE READING LEVELS OF USERS AND NONUSERS OF BRAILLE

Subjects	N	Reading Level		Diff.	df	*t*
		Mean	s			
Users	50	9.32	3.2	2.68	62	2.83**
Nonusers	14	6.64	3.5			

TABLE 16

COMPARISON OF MEAN WORDS PER MINUTE READ IN BRAILLE BY USERS AND NONUSERS OF BRAILLE

Subjects	N	Words per Minute		Diff.	df	*t*
		Mean	s			
Users	50	34.30	14.2	4.00	62	.91
Nonusers	14	30.30	12.7			

TABLE 17

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO RECALLED AFFECT TOWARD BRAILLE INSTRUCTION

Recalled Feeling toward Braille Instruction	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Enjoyed braille lessons	49	38	77.6	1	2.92
Did not enjoy braille lessons	30	17	56.7		

TABLE 18

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO ORGANIZATIONAL AFFILIATION WITH OTHER BLIND PEOPLE

Organizational Affiliation with Other Blind People	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Yes	24	17	70.8	1	.01
No	55	38	69.1		

Table 19 shows that a subject's attitude toward universal braille opportunity for blind children was not related to his own tendency to use or not use braille.

Users of braille have been compared according to three dimensions of attitude: recalled feeling toward braille instruction, preference to affiliate or not to affiliate with other blind people, and opinion on universal braille opportunity. Since in none of the three comparisons did the proportion of users differ significantly, it cannot be argued that a strong relationship exists between the habit of using braille and any of these three aspects of attitude.

TABLE 19

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO ATTITUDE TOWARD UNIVERSAL BRAILLE OPPORTUNITY FOR BLIND CHILDREN

Should Braille Be Offered to All Blind Children?	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Yes	68	48	70.6	1	.01
No	11	7	63.6		

Summary

This section has described the degree of relationship established between a subject's tendency to use or not to use braille and several variables suspected of being significant. Degree of visual loss, IQ, and braille reading level appeared to differentiate significantly between users and nonusers of braille. In general, the users were brighter and more severely handicapped and, as would be expected, read braille at a higher grade level than nonusers. Although differences in age, sex, number of school grades completed, braille reading rate, and recalled affect toward braille instruction were not statistically significant, users, on the whole, tended to be slightly younger, more educated, and faster in braille reading than nonusers; the users also included slightly higher proportions of females and subjects who had enjoyed braille instruction. Source of braille instruction, employment, attitude toward universal braille instruction, and affiliation with other blind people appeared not to be relevant.

Stress is placed on the fact that the degrees of relationship thus far established have been between each of the variables and a subject's tendency to use or not to use braille. The extent to which the same variables were significantly related to the nature and frequency of a subject's use of braille will be discussed in subsequent sections.

The Nature and Frequency of Braille Uses

Specific uses of braille

The specific uses of braille mentioned by the subjects are shown in Appendix C. They are categorized as vocational or avocational. When a subject indicated that he used braille in his job or in conducting personal business, such use was considered vocational. When a subject used braille in a hobby or in a group activity of a recreational nature, it was considered avocational.

The most frequently mentioned vocational uses of braille were the following: taking messages during the course of telephone conversations; filing names, addresses, and other pertinent information on friends, associates, or clients; taking lecture notes; recording and reading recipes; teaching braille to other blind people; and corresponding by mail. In avocational activities, several subjects indicated that they used braille to read books or periodicals and to play scrabble, bingo, and cards.

In vocational activities, a greater number of subjects used braille as a means of writing than as a mode of reading. Table 20 indicates that the most popular mode of writing was the slate-and-stylus.

TABLE 20

MODES OF WRITING INDICATED BY SUBJECTS

Mode	No. Who Used	No. Who Used as Primary Mode
Slate-and-stylus	41	30
Braille writer	14	6
Regular typewriter	28	15

Several of the subjects subscribed to or at least regularly read periodicals in braille. Most often mentioned were The Reader's Digest and a number of religious publications such as Unity, The Catholic Review, and the Matilda Ziegler magazines. The Weekly News, Life and Health, and The Braille Book Review were also indicated by several. In addition, the subjects reported using a variety of braille materials including watches and clocks, sheet music and metronomes, writing boards, slate-and-stylus sets, maps, braille writing paper, correspondence textbooks, and playing cards. Though the subjects tended to have few braille books of their own, the majority subscribed to the Wayne County Library for the Blind for braille or talking book editions or both. Reading in braille tended to be avocational in nature.

The frequency of braille use by activity area

The number of subjects who indicated a particular frequency of braille use in the two major activity areas is shown in Table 21. The four frequency choices of the questionnaire were reduced to two. When a subject indicated that he used braille every day or a few times each week, his use was considered frequent. When he used braille in an activity a few times each month or year, his use was considered infrequent. The data just simply did not lend themselves to any greater refinement.

TABLE 21

NUMBER OF SUBJECTS WHO USED BRAILLE ACCORDING TO FREQUENCY OF USE IN TWO AREAS OF ACTIVITY

Activity	Frequency of Use		
	Frequent	Infrequent	Total
Vocational	29	7	36
Avocational	15	30	45

Fewer subjects used braille vocationally than avocationally, but those who used it in vocational activities used it more frequently. In both activity areas, the number who used braille on a frequent basis constituted a rather small proportion of the total sample.

Nature of braille use related to the variables

Speculation as to why some subjects found braille more useful in the activity areas than did others leads to a reconsideration of the variables. Table 22 shows the relationship between braille use in each of the two activity areas and the variables. All figures shown are chi-squares. In the case of source of braille instruction, sex, marital status, degree of visual loss, employment, and attitudes, subjects were divided according to the categories shown in the first section of this chapter. For each of the remaining variables, the use of the chi-square technique necessitated the formation of new categories. Subjects above the median in age, IQ, and braille reading proficiency were compared with those below the median. Subjects with one or more years of college were compared with those who had completed the twelfth grade and also with those who had completed less than twelve grades.

Brighter, better-educated, more-handicapped, employed subjects who were proficient braille readers and had enjoyed braille

TABLE 22

VOCATIONAL AND AVOCATIONAL USES OF BRAILLE RELATED TO THE VARIABLES

Variable	df	Activity	
		Vocational	Avocational
Source of braille instruction	1	0.00	0.51
School grades completed	2	10.72**	0.47
I.Q.	1	5.35*	0.00
Age	1	1.51	0.34
Sex	1	0.55	0.42
Marital status	1	1.73	0.04
Degree of visual loss	2	19.95**	1.63
Employment	2	7.57*	0.56
Braille reading level	1	16.08**	0.51
Braille reading rate	1	7.59**	1.13
Attitude toward braille instruction	1	5.78*	0.74
Organizational affiliation	1	0.04	0.00
Attitude toward universal braille education	1	0.10	1.34

lessons were more likely than others to use braille vocationally. The relationships established earlier between several variables and the general tendency to use braille were probably a reflection of the marked differentiation between those who did and those who did not use braille in vocational activities. None of the variables differentiated the users and nonusers in avocational activities.

The Subjects' Proficiency in Braille Reading

The mean grade level for those who read the Gray Oral Reading Paragraphs was 8.72, and the mean rate was 33.37 words per minute. Table 23 shows the statistical relationship of the variables to braille reading grade level and rate. The procedures employed were similar to those employed in Table 22 except that the total number of subjects was reduced because only sixty-four subjects read the paragraphs. Organizational affiliation and attitude toward universal braille education were omitted from this section.

More highly educated subjects read the paragraphs more rapidly and at a higher grade level than others. Subjects who had enjoyed their braille instruction were significantly more likely to be rapid braille readers than those who had not. Although a higher proportion of subjects who had enjoyed braille also were good readers of braille, the difference was not significant. A higher

TABLE 23

RELATIONSHIP BETWEEN THE VARIABLES AND BRAILLE READING PROFICIENCY

Variable	df	Reading Grade Level	Reading Rate
Source of braille instruction	1	0.00	0.00
School grades completed	2	27.64**	7.22*
I.Q.	1	20.75**	3.21
Age	1	0.25	0.06
Sex	1	0.06	0.56
Marital status	1	0.37	0.07
Degree of visual loss	2	3.46	0.08
Employment	2	6.05*	1.38
Reading level	1	--	9.01**
Attitude toward braille instruction	1	3.21	5.40*

proportion of the totally blind were included among the good and rapid readers of braille; however, the differences between proportions were not statistically significant. Subjects who were employed appeared more likely to be good braille readers but were not necessarily more likely than the quasi-employed and unemployed subjects to be rapid readers. Braille reading rate and level appeared to be highly related to each other: the better readers tended to be faster readers of braille. Source of braille instruction, age, sex, and marital status again seemed to be irrelevant factors.

Table 24 indicates that subjects who claimed to be users of braille were less reluctant than professed nonusers to demonstrate their proficiency by reading the paragraphs. The veracity of the subjects' claims appears to be confirmed by this finding.

TABLE 24

COMPARISON OF PROPORTIONS OF USERS OF BRAILLE ACCORDING TO WILLINGNESS TO READ ORAL PARAGRAPHS

Reading Paragraphs	No. of Subjects	No. of Users	Pct. of Users	df	χ^2
Yes	64	49	89.1	1	5.14*
No	15	6	40.0		

Comparison of Users and Nonusers of the Talking Book

Generally, the same variables employed to evaluate braille use were also employed to evaluate talking book use. An exception, of course, was proficiency, of which no assessment was attempted for the talking book. Table 25 shows the chi-square relationship between each of eight variables and a subject's tendency to use or not use talking books. In each comparison, all seventy-nine subjects

TABLE 25

COMPARISON OF PROPORTIONS OF USERS OF TALKING BOOKS ACCORDING TO EIGHT VARIABLES

Variable	df	χ^2
Source of braille instruction	1	2.03
Sex	1	0.73
Marital status	1	0.51
Degree of visual loss	2	0.32
Employment	2	0.45
Attitude toward braille instruction	1	1.14
Organizational affiliation	1	0.09
Attitude toward universal braille opportunity	1	1.39

were included. Table 26 shows the *t* ratio established for the remaining variables characterized by a range of scores or quantities. Brighter subjects who read braille well appeared more likely than other subjects to use the talking book.

Table 27 shows that the number of subjects who used the talking book in avocational activities nearly doubled the number who used it vocationally; however, those who used the talking book vocationally used it more frequently. For neither type of activity did

TABLE 26

COMPARISON OF USERS AND NONUSERS OF TALKING BOOKS ACCORDING TO FIVE DIFFERENT VARIABLES

Variable	Subjects	N	Mean	s	Diff.	df	*t*
Highest school grade completed	Users	64	12.05	2.5	0.65	77	0.78
	Nonusers	15	11.40	3.5			
I.Q.	Users	59	107.23	20.1	18.23	62	9.35**
	Nonusers	11	89.00	11.2			
Age	Users	64	30.63	6.4	-2.14	77	0.70
	Nonusers	15	32.67	7.8			
Reading level	Users	53	9.06	3.6	2.42	62	2.53**
	Nonusers	11	6.64	3.2			
Reading rate	Users	53	34.10	13.8	4.24	62	1.10
	Nonusers	11	29.86	10.9			

TABLE 27

NUMBER OF SUBJECTS WHO USED THE TALKING BOOK ACCORDING TO FREQUENCY OF USE IN TWO AREAS OF ACTIVITY

Activity	Frequency of Use		
	Frequent	Infrequent	Total
Vocational	19	13	32
Avocational	25	35	60

as many as one-third of the subjects find it useful every day or a few times each week.

Table 28 indicates that brighter, better-educated, employed subjects who were good readers of braille were more likely than others to use the talking book vocationally. Though a significantly high proportion of subjects opposed to universal braille instruction used the talking book in a vocational capacity, the actual numbers involved in this case were too small to allow any conclusions. None of the variables distinguished the users from the nonusers in avocational activities.

Thus, brighter subjects who read braille well also were more likely to be users of the talking book. Subjects who used the talking

TABLE 28

VOCATIONAL AND AVOCATIONAL USES OF THE TALKING BOOK RELATED TO THE VARIABLES

Variable	df	Activity	
		Vocational	Avocational
Source of braille instruction	1	0.05	0.10
School grades completed	2	11.38**	0.01
I.Q.	1	4.04*	0.50
Age	1	2.87	0.00
Sex	1	0.46	0.04
Marital status	1	0.03	0.86
Degree of visual loss	2	1.81	0.03
Employment	2	13.43**	2.51
Braille reading level	1	5.22*	0.19
Braille reading rate	1	0.25	0.00
Attitude toward braille instruction	1	0.60	0.48
Organizational affiliation	1	0.01	0.02
Attitude toward universal braille opportunity	1	4.04*	0.01

book in a vocational capacity were further characterized by a relatively high level of gainful employment and education completed.

Comparative Usefulness of Braille and the Talking Book

Since an educational background that included braille instruction was a criterion for the selection of subjects, all subjects interviewed were former students of braille. Only thirty-four, or 43.0 percent, of these subjects reported ever having received any instruction in the use of talking books during their education as blind children. Nevertheless, 81.0 percent reported that they currently used talking books as compared to 69.6 percent for braille.

The number of subjects who indicated vocational and avocational uses for each medium has already been shown by Tables 21 and 27. For both braille and talking book, vocational uses tended to be fewer in number but higher in frequency. A slightly higher number of subjects used braille than the talking book vocationally, but several more used the talking book avocationally. Table 29 shows the percentages who used each of the techniques in vocational and avocational activities.

That subjects preferred auditory techniques for reading is further indicated by a tabulation of their responses to several

TABLE 29

PERCENTAGES OF SUBJECTS WHO USED BRAILLE AND THE TALKING BOOK IN VOCATIONAL AND AVOCATIONAL ACTIVITIES

Medium	Activities	
	Vocational	Avocational
Braille	45.6	57.0
Talking book	40.5	76.0

questionnaire items. When asked whether they preferred to read a book in braille or listen to it in talking book form, twenty-four chose the former and fifty-five the latter. When asked how they actually did most of their reading, they replied as follows:

Talking book	42
Aid of a sighted reader	25
Braille	23
Regular print	4
Enlarged print	1
Not at all	1

Of the sixty-two subjects who claimed to be library subscribers, forty-two said that they borrowed mostly talking books, and twenty said that they borrowed mostly braille editions. These findings were confirmed by a visit to the Wayne County Library for the Blind where it was revealed that the same sixty-two subjects were actual subscribers as follows:

30 borrowed talking books but not braille editions
8 borrowed braille editions but not talking books
9 borrowed both but preferred talking books
3 borrowed both but preferred braille editions
12 borrowed both in equal numbers

Braille's potential value to the blind individuals as a direct means of independent written communication is its outstanding advantage over auditory media. However, for the purposes of acquiring information and of reading for pleasure, the blind subjects of this study indicated a preference for auditory techniques.

CHAPTER IV

SUMMARY AND CONCLUSIONS

The purpose of the present study was to ascertain the usefulness of braille as compared to that of the talking book to blind adults who were former braille students.

Interviewed were forty-two male and thirty-seven female blind residents of the metropolitan Wayne County area who had received braille instruction either in the Detroit public schools or at the Michigan School for the Blind in Lansing. Subjects whose braille instruction had been in Detroit were a slight majority. Ages ranged from twenty-one to forty-six, with the average in the early thirties. Nearly two-thirds of the subjects were unmarried. Typically, they were average in intelligence and had completed the twelfth grade. Subjects were rather evenly divided among three levels of visual defects ranging from total blindness to the upper limit of legal blindness. About one-third were unemployed.

Responses to an original interview questionnaire permitted the determination of which subjects used braille and the talking book and how often they used the two media in vocational and avocational activities. Information on adult braille reading proficiency was provided by the results of the Gray Oral Reading Paragraphs administered to sixty-four subjects in braille edition. The findings were as follows:

1. Of the seventy-nine subjects, fifty-five, or nearly 70 percent, continued to use braille, while sixty-four, or 81 percent, used the talking book either exclusively or in addition to braille.

2. Subjects who reported using braille avocationally outnumbered those who indicated using it vocationally, but those who did use braille in vocational activities tended to use it on a more frequent basis. The same generalization can be applied to the talking book.

3. A slightly larger number of subjects used braille vocationally than used the talking book vocationally; in contrast, a considerably larger number used the talking book avocationally than used braille for that purpose.

4. Specific uses made of braille involved the technique's value as a means of writing rather than as a means of reading. For writing, the slate-and-stylus was preferred by a larger number than the braille writer or typewriter. Taking telephone messages,

filing personal data, keeping recipes, taking lecture notes, and corresponding with friends were frequently mentioned specific braille writing uses.

5. For reading books, the talking book was preferred by 70 percent of the subjects. Their preferences were confirmed by library records. For the acquisition of current knowledge, preference was not only given to talking books but to other auditory media such as radio and television and sighted readers.

6. Those who used braille were characterized by severe visual loss, high intelligence, and a high level of braille reading ability. Although the number of school grades completed, sex, braille reading rate, and attitude toward braille instruction did not quite produce statistically significant results, the users as a group included a majority of more highly educated, younger, female subjects who read braille rapidly and recalled having enjoyed braille instruction. Source of braille instruction, employment, attitude toward universal braille education, and organizational affiliation appeared not to be relevant.

7. Subjects who used braille vocationally were characterized by high intelligence, considerable education, severe visual loss, a high level both of braille reading ability and speed, and a positive

attitude toward their braille instruction. None of the variables significantly differentiated the users from the nonusers in avocational activities.

8. The mean braille reading level was about ninth grade, and the mean reading rate was about 33 words per minute. Brighter, more highly educated subjects who were employed appeared to be significantly more likely to be good readers of braille. Severely handicapped subjects who had enjoyed braille instruction also seemed to be more likely to read braille well, but their advantage was just short of statistical significance. The faster readers tended to be those who had received more education and had enjoyed braille instruction. Although the faster readers included a high proportion of the brighter subjects, the advantage was not quite significant. Faster readers tended to be better readers of braille, another demonstration of the fact that rate and comprehension seem to be related, even in braille reading.

9. In general, the variables appeared to be less related to a subject's use of talking books than to his use of braille. The users of talking books were clearly distinguished only by high intelligence and a high braille reading level. However, brighter, highly educated, employed subjects who were good braille readers

were more likely to use the talking book in vocational activities. The avocational uses of the talking book were not highly related to any of the variables.

It appears, therefore, that subjects who were best able to take advantage of braille's potential as a communicative tool were also in the best position to utilize the talking book in place of or in addition to braille. In effect, the higher the intellectual ability and educational attainment, the greater the likelihood that a subject would fully exploit the various available media. The results also suggest that subjects who were the most handicapped visually may have been the better equipped to utilize the media, especially braille. Some of the factors evaluated were surprisingly lacking in relevance, notably the source of braille instruction. The review of the literature and conversations with educators of the blind had led the investigator to anticipate that former residential school pupils would be more likely than those from day-school classes to be committed to braille use, but this simply was not the case in this study.

That braille was useful to some extent to a majority of the subjects is encouraging. Nevertheless, it must be stressed that braille was used on a frequent basis by the majority as a means of written communication rather than as a vital reading medium. True, those subjects who were occupied in specialized professions such as teaching and social work in which their work was primarily with other blind people tended to use braille rather intensively both for reading and writing. There were others who employed braille frequently as a reading medium, but most of them seemed to do so because they derived personal pleasure from their mastery of a challenging mental and physical task. When it is considered that the majority did not seem to derive this kind of satisfaction from braille and, in fact, preferred other media, a need for an evaluation of the prevailing motivational techniques, philosophies, goals, and emphases of educational programs for the blind may be in order. Perhaps the education of the blind could and should place greater emphasis on braille as a tool of writing and not only for those pupils who have manifested considerable capability early in their lives but also for those many others who might never have been exposed to braille-writing because of a diagnosis that was actually focused primarily on reading capability.

The near absence of any stress on supplementary or substitute auditory techniques as expressed by the subjects is indicative of the unrealistic emphasis that has sometimes been placed on braille as an exclusive medium of communication. In light of the reported use of auditory techniques by a high proportion of the subjects, it would seem that programs for the blind might reconsider their own efforts to develop in pupils the ability to use these techniques more effectively.

For reading books, nearly 70 percent preferred the talking book. This proportion is fairly consistent with the estimated figures for the total metropolitan Detroit area as revealed by the Wayne County librarian for the blind in a recent newspaper article (Parks, Detroit News, February 17, 1963, p. 15-E): 1,200 subscribers use the 3,800 talking books, and 750 use the 2,400 braille titles. The same source describes anticipated improvements in reducing the bulk of talking books, and this would presumably encourage talking book subscription even more, since a similar improvement for braille does not appear possible. The fact that the majority of the subjects of this study seemed to prefer talking books is all the more meaningful when it is remembered that they comprised somewhat of an elite group in the total blind population in that they have, as a group, had the benefit of considerable education, of which a major ingredient has been braille instruction.

That braille maintained a reputation for necessity in the minds of the blind subjects, even among those who themselves professed no present use for it or who even expressed a personal dislike for it, is indicative of the high esteem in which braille has traditionally been held. That there were a few even among the less able subjects who did learn to use braille techniques with some degree of adequacy speaks well for the quality and dedication of their educators but at the same time casts some doubt on the accuracy of early judgments concerning the capabilities of their blind pupils. The high mean level of adult reading ability for the group attests also to the quality of instruction, the quality of motivation on the part of the subjects themselves, and the apparent retention or holding power of the braille skill itself. Indeed, the subjects tended to have retained their braille skill over a long period of years whether they used it presently or not or whether they had been deemed good or poor braille students.

Buswell (National Society, 1956, I, p. 52) has estimated that almost one-half the adult population read below a ninth-grade level and that one-third of these are functionally illiterate in that they are unable to read at a fifth-grade level. The mean grade level for subjects in this study who read the Gray Oral Reading Paragraphs was nearly ninth grade and less than two-fifths read below the fifth-grade level. When compared to the reading proficiency of the sighted adult population at large, the subjects appeared to measure favorably.

That such a high proportion of the subjects, select as they may have been, read at a high level of ability and were subscribers to library materials is encouraging. MacMahon (National Society, II, p. 254) has estimated that fewer than one-half of the people in the United States ever read a book of any kind and that fewer than 10 percent can really be considered readers of library books. Asheim (National Society, II, p. 6) has said that "active readers make up more than 25-30% of any group that reflects, with reasonable accuracy, a cross-section of the total population." In contrast, nearly 79 percent of the subjects subscribed to the library either for braille or talking book editions. However, only a small proportion of the subjects reported that they read magazines or newspapers on their own on a regular basis; an estimated 60 to 70 percent of the general adult population read one or more magazines regularly and 85 to 90 percent read newspapers (National Society, II, p. 8). It appears that the blind subjects tended to rely heavily upon passive means for acquiring the kinds of information printed in periodicals because braille and talking book, the media providing them with the greatest degree of independence in reading, do not provide fresh coverage of current events.

It was probably in speed that the blind subjects were most handicapped in their reading. The mean rate of approximately 33 words per minute seems very slow in comparison to the 300 words per minute established as average for sighted adults by Shores (National Society, II, p. 272). The subjects' mean rate also is considerably less than that estimated by Nolan for adult braille readers (1963, p. 315). The comparative slowness with which even the more effective braille readers progress through the material is a primary explanation for the fact that blind readers experience difficulty finding immediately functional uses for braille in their vocational and avocational pursuits.

Surprisingly, braille skills were generally related very little to the employment of the subjects. The issue of their instruction in braille had been involved in very few job interviews, and never were subjects actually asked to demonstrate their skill in braille in order to acquire jobs. Even in those professions where braille was used extensively, the subjects' skill must have been assumed for no evidence of skill was required.

The feelings and opinions expressed by the subjects suggest related research needs. The negativism manifested by several subjects toward social agencies indicates the need for a rigorous self-evaluation of goals and philosophies on the part of these agencies. The relatively high number of subjects who were unmarried or unemployed or who expressed feelings of isolation accentuates the need for more intensive research concerning life planning and postschool guidance for the blind. The suggestions raised by the subjects for educational improvement (Appendix D) merit consideration by educators interested in action research. Implicit in the analysis of the relationship between the media and the variables were interrelationships of the several variables to one another. An analysis in depth of these interrelationships might conceivably provide data meaningful to a more comprehensive understanding of the personality dynamics of blind adults.

The fundamental need implied by the results of this study is a total reassessment of the roles of all the communicative media, including braille and the talking book, to determine how their use might more effectively promote maximum independence and social adjustment for the blind.

APPENDIXES

APPENDIX A

THE INTERVIEW QUESTIONNAIRE

Name________________________ Birthdate________ Phone_______

Address___________________________ Education_______________

Occupation_________________________ Employer_______________

Marital Status: Single______ Married______ Divorced______

Children______

1. Where did you study braille?______________________________

2. When?____

3. When you were studying braille, did you enjoy it?

   No______ Yes______ Indifferent______

4. When applying for a job:

   a. Have you ever been asked if you have had instruction in braille?

      No______ Yes______

   b. Did the ability to read braille help you get a job?

      No______ Yes______

   c. Were you ever asked to demonstrate that you could read braille?

      No______ Yes______

5. When you were in school did you ever receive instruction using talking books, tape recorder, or other special auditory equipment?

   No______ Yes______

6. How do you get the news?________________________________

   ____

7. Do you use talking books, tape recorders, or other auditory equipment at the present time?

   No______ Yes______

	Every Day	Few Times a Week	Few Times a Month	Few Times a Year	How?
In your job or for personal business?					
In hobbies, recreation, or social activities?					

8. What kinds of literature do you have in the house?__________

   ____

   ____

9. How do you do most of your reading?

   ______ In ordinary print

   ______ Large print

   ______ Braille

______ With records or talking books

______ With help of sighted reader

______ Other ______________________________

10. Do you use braille now?

______ No (if no, why not)

____

____

______ Yes

	Every Day	Few Times a Week	Few Times a Month	Few Times a Year	How?
In your job or for personal business?					
In hobbies, recreation, or social activities?					

11. Do you think braille instruction should be offered to all blind children?

______ No Why not? ______________________

______ Yes Why? ______________________

12. Do you have any suggestions for improving the education of blind children?

____

____

13. Do you subscribe to any braille magazines?

_______ No _______ Yes

What? ____________________ From whom? ______________________

14. Do you order materials from any services for the blind?

_______ No _______ Yes

What? ____________________ From whom? ______________________

15. Do you borrow reading materials from the public library?

_______ No _______ Yes

a. What kinds of books do you get from the library?

____

b. Are they in braille? _______

Talking books? _______

Large print? _______

Regular print? _______

c. Do you read them by yourself? _______

Assistance? _______

16. Do you use a braille writer? _______ Regular typewriter? ______

Slate and stylus? _______ Which do you use most? ______________

17. If you had your choice, would you rather read something in braille or listen to it in talking book?

_______ Braille _______ Talking book

18. Do you belong to any organizations primarily of or for blind people?

_______ No _______ Yes What? ______________________________

APPENDIX B

THE GRAY ORAL READING PARAGRAPHS[1]

1

A boy had a dog.
The dog ran into the woods.
The boy ran after the dog.
He wanted the dog to go home.
But the dog would not go home.
The little boy said,
"I cannot go home without my dog."
Then the boy began to cry.

2

Once there was a little pig.

He lived with his mother in a pen.

One day he saw his four feet.

"Mother," he said, "what can I do with my feet?"

His mother said, "You can run with them."

So the little pig ran round and round the pen.

3

Once there was a cat and a mouse. They lived in the same house. The cat bit off the mouse's tail. "Pray puss," said the mouse, "give me my long tail again."

"No," said the cat, "I will not give you your tail till you bring me some milk."

4

Once there lived a king and a queen in a large palace. But the king and queen were not happy. There were no little children in the house or garden. One day they found a poor little boy and girl at their door. They took them into the beautiful palace and made them their own. The king and queen were then happy.

5

One of the most interesting birds which ever lived in my bird-room was a blue-jay named Jackie. He was full of business from morning till night, scarcely ever still. He had been stolen from a nest long before he could fly, and he had been reared in a house long before he had been given to me as a pet.

---

[1] Published in braille by the American Printing House for the Blind, Louisville, Kentucky.

6

The part of farming enjoyed most by a boy is the making of maple sugar. It is better than blackberrying and almost as good as fishing. One reason why a boy likes this work is that someone else does most of it. It is a sort of work in which he can appear to be very industrious and yet do but little.

7

It was one of those wonderful evenings such as are found in this magnificent region. The sun had sunk behind the mountains, but it was still light. The pretty twilight glow embraced a third of the sky, and against its brilliancy stood the dull white masses of the mountain in evident contrast.

8

The crown and glory of a useful life is character. It is the noblest possession of man. It forms a rank in itself, an estate in the general good will, dignifying every station and exalting every position in society. It exercises a greater power than wealth, and is a valuable means of securing honor.

9

He was approximately six feet tall and his body was well proportioned. His complexion inclined to be florid; his eyes were blue and remarkably far apart. A profusion of hair covered the forehead. He was scrupulously neat in his appearance; and, although he habitually left his tent early, he was well dressed.

10

Responding to the impulse of habit, Josephus spoke as of old. The others listened attentively but in grim and contemptuous silence. He spoke at length, continuously, persistently, and ingratiatingly. Finally exhausted through loss of strength he hesitated. As always happens in such exigencies he was lost.

11

The attractions of the American prairies as well as of the alluvial deposits of Egypt have been overcome by the azure skies of Italy and the antiquities of Roman architecture. My delight in the antique and my fondness for architectural and archaeological studies verges onto a fantacism.

12

The hypotheses concerning physical phenomena formulated by the early philosophers proved to be inconsistent and in general not universally applicable. Before relatively accurate principles could be established, physicists, mathematicians, and statisticians had to combine forces and work arduously.

APPENDIX C

SPECIFIC USES OF BRAILLE

Listed below are the specific braille uses indicated by the subjects in response to item number 10 on the interview questionnaire.

Vocational

- Taking messages on telephone
- Filing names, addresses, other vital statistics
- Keeping insurance books
- Recording, reading recipes
- Lecture notes
- Teaching braille to other blind people
- Correspondence
- Using braille ruler
- Figuring financial affairs
- Bookkeeping
- Reading, copying music

Avocational

- Reading periodicals
- Reading books
- Reading, copying braille music
- Operating ham radio
- Pen pals correspondence
- Composing music, writing poetry
- Record library
- Cards, scrabble, bingo, other games
- Figuring, keeping bowling scores

APPENDIX D

SUGGESTIONS FOR EDUCATIONAL IMPROVEMENT

The following suggestions and criticisms were made by the subjects in response to item number 12 on the interview questionnaire.

Should start slate-and-stylus, then braille.
More extensive speech instruction.
Better job of training and testing.
Sex education.
More athletics.
More help for mentally handicapped blind.
More science and math for college prep students.
Shouldn't teach evolution.
More parent education.
Higher academic standards.
Should explore pupils' special interests more fully.
Training should be more in line with real occupational opportunities.
More high school manual training (not basketweaving).
School day should be longer.
More travel training.
More up-to-date textbooks.
More orientation in housekeeping.
More braille at high school level.
More emphasis on tape recorder, talking book.
Too much time in transportation (day school).
More research on reading aids.
Need something faster than braille for music.
Residential school should be changed . . . not conducive to real emotional stability.
Residential school doesn't provide enough contact with sighted people . . . residential school kids live in a blind world . . . not adjusted to normal environment.

Should close all the schools for the blind . . . send the students to regular schools.
Should treat blind students more like normal.
Too many impatient teachers.

BIBLIOGRAPHY

Adult Reading: 55th Yearbook of the National Society for the Study of Education. 2 vols. Chicago: University of Chicago Press, 1956.

American Foundation for the Blind, Inc. Leisure Activities Study. New York: The Foundation, 1961.

Buell, Josephine. "Rehabilitation Status of Former Students of the California School for the Blind," New Outlook for the Blind, XLVIII (1955), 169-74.

Carroll, T. E. Blindness: What It Is, What It Does, and How To Live with It. Boston: Little, Brown, 1961.

Chevigny, Hector, and Braverman, Sydell. The Adjustment of the Blind. New Haven: Yale University Press, 1958.

Cholden, L. D. A Psychiatrist Works with Blindness. New York: American Foundation for the Blind, Inc., 1958.

Cutsforth, Thomas. The Blind in School and Society: A Psychological Study. New York: American Foundation for the Blind, Inc., 1957.

Dixon, W. J., and Massey, F. J. Introduction to Statistical Analysis. New York: McGraw-Hill, 1957.

Donahue, Wilma. "History and Use of Electronic Readers for the Blind," American Psychologist, V (1950), 341.

Farrell, Gabriel. The Story of Blindness. Cambridge: Harvard University Press, 1956.

Fertsch, Pauline. "An Analysis of Braille Reading," Outlook for the Blind, XL (1946), 128-31.

Fertsch, Pauline. "Hand Dominance in Braille Reading," American Journal of Psychology, LX (1947), 335-49.

Fitting, E. A. "Rehabilitation Status of Former Students--Michigan School for the Blind," New Outlook for the Blind, XLIX (1955), 20-25.

Graham, Milton. Social Research on Blindness: Present Status and Future Potentials. New York: American Foundation for the Blind, Inc., 1960.

Hayes, Samuel. Contributions to a Psychology of Blindness. New York: American Foundation for the Blind, Inc., 1941.

Holland, B. F. "Speed and Pressure Factors in Braille Reading," Teacher's Forum, VII (1934), 13-17.

Holland, B. F., and Eatman, Pauline Fertsch. "The Silent Reading Habits of Blind Children," Teacher's Forum, VI (1933), 4-11.

Krebs, M. B. "A Braillest Talks with Resource Teachers," New Outlook for the Blind, LIII (1959), 132-36.

Lende, Helga. What of the Blind? A Survey of the Development and Scope of Present Day Work with the Blind. 2 vols. New York: American Foundation for the Blind, Inc., 1941.

Lowenfeld, Berthold. "The Visually Handicapped," Review of Educational Research, XXXIII (1963), 38-47.

Mackenzie, Clutha. World Braille Usage. UNESCO, 1954.

Maxfield, Kathryn. The Blind Child and His Reading. New York: American Foundation for the Blind, Inc., 1928.

Maxfield, Kathryn. Present Status of Instruction in Primary Reading in Residential and Day School Classes for the Blind. New York: American Foundation for the Blind, Inc., 1926.

Maxfield, Kathryn. "Reading Experiments Now in Progress," Outlook for the Blind, XXIX (1925), 8-11.

Nolan, Carson. "Reading and Listening in Learning by the Blind," Exceptional Children, XXIX (1963), 313-16.

Parks, Michael. "More Books for Blind Planned by Librarian," Detroit News, February 17, 1963, p. 15-E.

Pennsylvania State Council for the Blind. Adjustment to Blindness: A Study as Reported by the Committee To Study Adjustment to Blindness. Harrisburg: Pennsylvania's Department of Welfare, Commonwealth of Pennsylvania, 1954.

Ritter, C. G. Technical Research and Blindness: Some Recent Trends and Developments. New York: American Foundation for the Blind, Inc., 1956.

"Twentieth Year of Talking Books," New Outlook for the Blind, XLVIII (1954), 110-12.

U.S. Department of Commerce. Statistical Abstracts of the United States, 1962. Washington: U.S. Government Printing Office, 1962.

U.S. Department of Health, Education, and Welfare. Blind Children: Degree of Vision, Mode of Reading. Washington: U.S. Government Printing Office, 1961.

Zahl, P. A. (ed.). Blindness: Modern Approaches to the Unseen Environment. Princeton, N.J.: Princeton University Press, 1950.